

DOCUMENT RESUME

ED 076 875

AC 014 387

AUTHOR Andersen, Ronald; And Others
TITLE Health Service Use. National Trends and Variations - 1953-1971.
INSTITUTION Public Health Service (DHEW), Bethesda, Md. National Center for Health Services Research and Development.
REPORT NO DHEW-Pub-HSM-73-3004
PUB DATE Oct 72
NOTE 61p.

EDRS PRICE MF-\$0.65 HC-\$3.29
DESCRIPTORS Comparative Analysis; Disadvantaged Groups; Equalization Aid; Federal Government; *Health Services; *Low Income Groups; Medicine; *National Norms; Public Policy; *Resource Allocations; Technical Reports; *Trend Analysis

ABSTRACT

Highlights concerning the major policy issues affecting the distribution of health services in the United States are presented. Findings which support the view that the United States is attaining equalization of health care opportunity include: (1) The gap between the percentage of low and high income people seeing a physician during the year narrowed considerably between 1963 and 1970; (2) Once they see a physician, low income people average more visits than those of higher income; (3) The lowest income people are almost twice as likely to be admitted to a hospital as those with the highest incomes in 1970; and (4) Although non-whites and central city residents have longer lengths of stay once they are admitted to the hospital, their admission rates were still lower than for the rest of the population in 1970. It is concluded that while great improvements in health care for disadvantaged groups have occurred over the last 10 to 20 years, these groups are still not equal to the remainder of the population. (Author/CK)

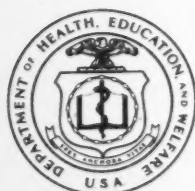
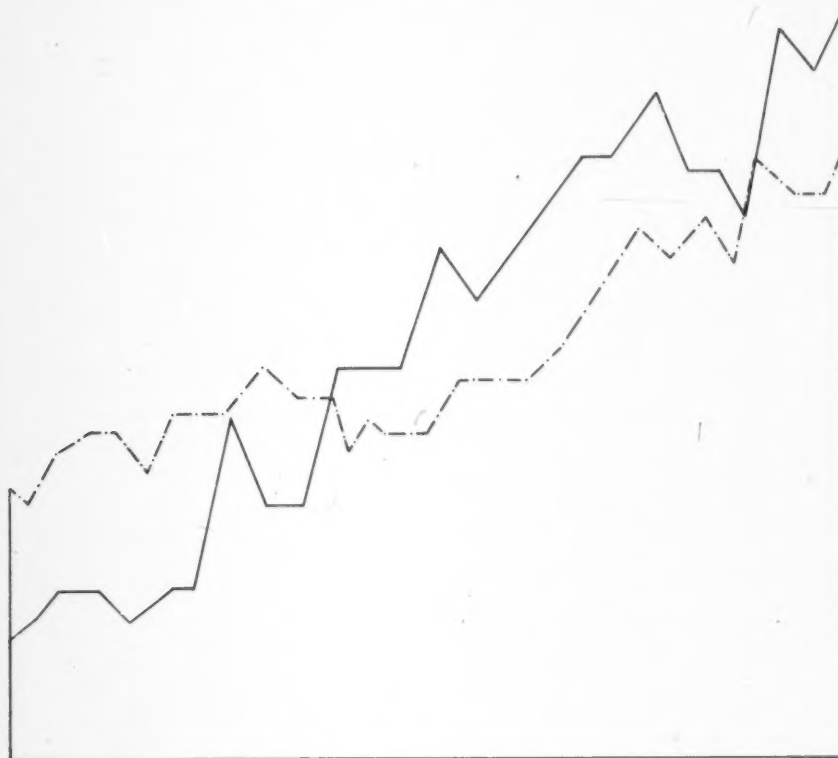
ED 076875

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY.

HEALTH SERVICE USE

National Trends and Variations - 1953-1971



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Health Services and Mental Health Administration
National Center For Health Services Research and Development

AC014387

HEALTH SERVICE USE

National Trends and Variations

Ronald Andersen, Study Director
Rachel McL. Greeley, Research Assistant
Joanna Kravits, Assistant Study Director
Odin W. Anderson, Principal Investigator

Center for Health Administration Studies
University of Chicago
and
National Center for Health Services
Research and Development

DHEW Publications No. (HSM) 73-3004
October 1972

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
HEALTH SERVICES AND MENTAL HEALTH ADMINISTRATION

TABLE OF CONTENTS

INTRODUCTION	1
FINDINGS	3
A. Regular Source of Care	3
B. Physician Care	8
C. Hospital Care	15
D. Surgical Procedures	19
E. Obstetrical Care	20
F. Dental Care	20
G. Utilization According to Medicaid Benefits in State of Residence	27
H. Disability Days and Physician Contacts	27
SUMMARY AND CONCLUSIONS	33
REFERENCES	35
METHODOLOGICAL APPENDIX	37
A. Definition of Variables	37
B. The Sample Design	43
C. Estimating Procedures	44
D. Factors Influencing Sample Estimates	49
1. Sampling Execution	49
2. Sampling Variances	51
3. Completeness of Population Coverage	51
4. Validity of the Data	54

INTRODUCTION

This report has two main purposes: to document trends in the public's use of health services in the United States and to consider major policy issues regarding the distribution of medical care according to age, income, race, and residence. The data included here are based on four parallel studies of random samples of the nation's families conducted in 1953, 1958, 1964, and 1971.¹ Changes over this time period are with particular emphasis given to those taking place between the last two studies. In addition to the trend data, more detailed tabulations from the most recent study compare the current utilization patterns of various subgroups in the population with respect to their use of physician, hospital, and dental care.²

In the current survey 3,880 families consisting of 11,822 individuals were interviewed in their homes in early 1971. One or more members of each family provided information regarding use of health services, the cost of these services, and how this cost was met for the calendar year 1970. While this report is limited to findings concerning utilization, later ones will deal with costs and methods of payment.

The sample was designed so that the inner city poor, the aged, and rural residents were over represented. This design allows for more detailed analyses of these special groups than would a self-weighting probability sample. All tables in this report are based on weighted distributions to correct for the over-sampling of the above groups and to allow estimates to be made for the total noninstitutionalized population of the United States.

Since the statistics in this report are based on a sample, they are subject to sampling variability. Particular care must be exercised where the unweighted number of observations is small. Consequently, no estimates based on fewer than 25 observations are published in the text tables. In addition the sampling errors of some estimates made in the report are given in the Appendix.

In addition to data provided by the sample families, information has been collected from physicians, clinics, hospitals, insuring organizations and employers about the families' medical care and health insurance for the survey year. This additional information serves to verify the family information as well as providing additional details. The report is based *only* on family information for the most recent study. A less extensive verification was done for the earlier studies and is incorporated into the estimates for those years. Subsequent reports will incorporate the verification findings and will provide comparisons among the various sources.³

This present report is divided into sections dealing with various aspects of the public's medical care. These include regular sources of care, physician visits,

hospital care, surgical procedures, maternity care, dentist visits, utilization according to level of Medicaid benefits in the state of residence, response to disability, and conclusions. The main body of the report is followed by a methodological appendix which includes variable definitions, sample design, estimating techniques, and a discussion of factors influencing the sample estimates.

FINDINGS

A. *Regular Source of Care*

Where people report they usually go when they are sick or for advice about their health influences whether or not they will seek care on a preventive basis. More importantly, once the decision to seek care is made, the regular source largely determines the type, amount, and continuity of care the patient receives.

The proportion of the population who names a place—such as a hospital or health center—rather than a particular doctor as their regular source of care increased considerably between 1963 and 1970 (Table 1). In contrast, the proportion that named a particular physician declined. Those claiming *no* regular source of care decreased slightly.

The trends for the population as a whole generally held for both sexes and all age groups (Table 1). Males in 1970, as in 1963, were somewhat less likely to report a regular source of care than were females. Children in both periods were most likely to have a clinic as their regular source of care and least likely to have no source of care. Young and middle aged adults were most likely to report no regular sources of care in both periods.

Changes in source of regular care between 1963 and 1970 varied considerably according to family income (Table 1). The proportion of the population in the low and middle income groups who named a particular M.D. as their regular source of care decreased considerably while remaining the same for the high income group. The proportion naming a clinic as the regular source of care increased for all groups. Only for the highest income group did the proportion reporting no regular source of care decrease. Thus, the differences according to income in the 1963 study have become more extreme with the poor less likely to have a regular M.D. and more likely to have no regular source of care.

The changes taking place for the nonwhite population between 1963 and 1970 parallel those for the low income group (Table 1). Compared to whites, the proportion of non-whites reporting an M.D. as their usual source of care decreased but there was no corresponding decrease in the percent of non-whites reporting no regular care. Nonwhites, then, can be characterized as the population group least likely to have any regular source and most likely to use a clinic, if indeed they report a source at all.

TABLE 1
Source of regular medical care by selected characteristics: 1963 and 1970

CHARACTERISTIC	SOURCE OF REGULAR CARE (2) ^a								TOTAL PERCENT 1963 and 1970
	Percent M.D.		Percent clinic		Percent osteopath, other		Percent no regular care		
	1963	1970	1963	1970	1963	1970	1963	1970	
Sex (20)									
Male	71	65	11	18	5	4	14	13	100
Female	74	69	11	17	4	5	11	9	100
Age (1)									
1- 5	78	69	11	21	3	4	8	6	100
6-17	72	67	13	20	5	5	10	8	100
18-34	69	65	10	18	4	4	17	13	100
35-54	72	68	9	14	5	4	14	13	99 ^c
55-64	75	67	9	16	4	5	12	12	100
65 and over	75	69	9	16	3	4	13	11	100
Family Income									
Low	63	56	17	24	4	4	16	16	100
Middle	75	68	10	17	4	5	11	10	100
High	75	74	7	14	6	4	12	8	100
Race (18)									
White	74	70	9	16	5	5	12	10	101 ^c
Non-white	62	51	20	30	3	3	15	16	100
Residence (19)									
SMSA, central city	-- ^b	59	-- ^b	23	-- ^b	4	-- ^b	15	101 ^c
SMSA, other urban	--	73	--	13	--	4	--	10	100
Urban, non-SMSA	--	72	--	20	--	1	--	7	100
Rural non-farm	--	70	--	15	--	7	--	8	100
Rural farm	--	64	--	20	--	3	--	12	99 ^c
Total	72	67	11	18	4	4	13	11	100

^aIn this and subsequent tables numbers in parentheses after variable names refer to variable definitions given in the Appendix.

^bNot available for 1963.

^cDoes not add up to 100 because of rounding error.

The residence data for 1970 in Table 1 points up similarities in regular source of care between the most urban and the most rural populations. Those people living in the central city of Standard Metropolitan Statistical Areas (SMSA's) were least likely to report an M.D. as their regular source of care and most likely to have no regular source. In both respects the group most like them is the rural farm population.

Table 2 presents data concerning the regular sources of care people have according to various combinations of age, income, and place of residence. Having a low income and living in a central city results in the greatest proportion of people who report no regular source of care for every age group. The group most likely to have a regular source of care is high income children regardless of residence. People living in the central city with a low family income are also the people most likely to report a clinic as a regular source of care. This finding is particularly pronounced for low income children. In fact, over half of these children who live in a central city report a clinic as their regular source of care. Middle and high income groups in every age and residence category report an M.D. as their regular source of care more often than do low income people.

The meaning of "clinic" as a regular source of care varies considerably. Persons who use a hospital outpatient department or even an emergency room as their regular source of care will report that they use a "clinic" as will members of a large prepaid group practice plan such as Kaiser or H.I.P. or users of a group of doctors in specialty practice. One way of differentiating care received by people who say they use a "clinic" is to ask if, within the institution where they obtain their regular care, they usually see the same doctor. Such information might be of particular value in assessing whether the patient feels comfortable about seeking care and the degree of continuity of care that he might receive.

Table 3 shows that there are considerable differences in the portions of people with a clinic as a regular source of care who see a particular doctor according to basic social and demographic variables. Females and older people are more likely to see a particular doctor as are whites and the higher income groups. Finally, urban dwellers in SMSA's are less likely to see a particular doctor than is the rest of the population. About two-thirds of the whites who use a clinic have a particular doctor at that clinic compared to only one-third of the non-whites. Higher income clinic users are more likely to name a particular doctor than are clinic users with less income. Old people are considerably more likely to have a particular doctor at their "clinic" than are younger people and women are somewhat more likely than men. Finally, city dwellers, where most of the emergency rooms and large out-patient departments are concentrated, are much less likely to have a particular doctor that they see.

These findings suggest that much of the "clinic" care reported by the well-off white segment of the sample is provided by pre-paid group practice or private doctors incorporated into non-prepaid clinics while the "clinic" care reported by less advantaged portions of the population is more depersonalized service

TABLE 2
Source of regular medical care by age by family income by residence: 1970

AGE (1)	FAMILY INCOME (7)	SOURCE OF REGULAR CARE (12) ^a						Percent no regular care			
		Percent M.D.			Percent clinic						
		SMSA, central city	Other urban	Rural	SMSA, central city	Other urban	Rural	SMSA, central city	Other urban	Rural	
0-17 ^b	Low	26	57	64	56	27	22	18	16	14	
	Middle	64	78	74	22	16	18	14	6	8	
	High	77	82	81	20	17	17	3	1	2	
18-64	Low	41	65	68	35	18	17	24	18	15	
	Middle	62	75	72	19	15	19	18	10	9	
	High	73	75	75	12	14	13	15	11	12	
65 and over	Low	60	76	72	21	13	18	19	11	11	
	Middle	77	80	80	18	17	14	5	4	6	
	High	73	78	80	24	9	8	3	13	12	
All ages	Low	41	67	68	39	18	18	21	15	14	
	Middle	64	76	73	20	15	18	15	8	8	
	High	74	78	78	15	15	15	10	7	8	
All ages	Total	61	75	73	24	16	17	15	9	10	

^aIn this table percentages are computed so that in any row the sum across a particular residence category equals 100, subject to rounding error. For example, in the first row for SMSA, central city: 26 + 56 + 18 = 100.

^bIncludes infants under one year of age.

provided in out-patient departments and emergency rooms. The fact that old people are much more apt to have a regular doctor when they use a clinic might be related to the financial impact of Medicare, which makes a private doctor possible.

TABLE 3			
Percent with clinic as source of regular care who usually see a particular doctor at clinic by selected characteristics: 1970			
CHARACTERISTIC	SEE PARTICULAR DOCTOR? (12)		
	Percent yes	Percent no	Total percent
Sex (20)			
Male	54	46	100
Female	61	39	100
Age (1)			
1-5 ^a	52	48	100
6-17	55	45	100
18-34	49	51	100
35-54	56	44	100
55-64	72	28	100
65 and over	78	22	100
Family income (7)			
Low	48	52	100
Middle	60	40	100
High	64	36	100
Race (18)			
White	63	37	100
Non-white	35	65	100
Residence (19)			
SMSA, central city	46	54	100
SMSA, other urban	50	50	100
Urban, non-SMSA	78	22	100
Rural non-farm	57	43	100
Rural farm	84	16	100
Total	57	43	100

^aExcludes infants under one year of age.

B. *Physician Care*

An important measure of use of medical services is the percentage of the population who see a physician during the year. It is probably the clearest measure of gross exposure of the public to a physician's decisions. Obviously, the physician cannot prescribe care until he encounters a patient.

Table 4 shows that in the period from 1958 through 1963 there was very little change in the proportion of the population who saw a physician. Between 1963 and 1970, however, there was a small increase. This holds true for both sexes, though the proportion of females seeing a physician was higher than the proportion of males in each study. The increase was not consistent among age groups, however; most of it was accounted for by people 55 and over.

Table 4 shows a substantially greater proportion of the low income population seeing a physician in 1970 than was true in 1963. The relative increase for middle income people is considerably less while there is no increase in the proportion seeing a physician in the upper income group. Consequently, the experience of the lowest income group in 1970 is much more similar to that of the highest group than was the case in 1963, although even in 1970 the proportion of the low income group seeing a physician is still somewhat lower.

This finding might be contrasted to what we have previously seen with respect to source of regular medical care. There, we found the poor less like the higher income groups in 1970 than in 1963. The gap appeared to be growing between the proportion of well-off and poor reporting a regular source of care and the proportion seeing a particular doctor at a clinic.

In 1970 the white population was clearly more likely to see a physician than was the nonwhite population (Table 4). Moreover, people living in the central city of SMSA's and their rural counterparts on farms appeared less likely to see a doctor than other urban dwellers and rural non-farm residents. This finding parallels the previous finding showing that the central city residents and the rural farm population were the least likely to report a regular source of care.

The 1963 study showed the children from lower income families were considerably less likely to see a physician during the year than those from higher income families. These differences in use by income tended to disappear for older age groups. Table 5 suggests that in the interval since 1963 the gap has narrowed considerably. Among children one to five years of age the proportion seeing a doctor increased in the low income groups but actually decreased slightly in the middle and high income categories. The increase in proportions seeing a doctor for all children in the six to seventeen group was also primarily accounted for by the low income children. Thus, in 1970 the difference in the proportion of children seeing a doctor according to income, while still considerable, was nonetheless substantially smaller than had been the case in 1963.

TABLE 4 Percent seeing a physician during the survey year by selected characteristics: 1958, 1963, and 1970			
CHARACTERISTIC	PERCENT SEEING A PHYSICIAN (14)		
	1958	1963	1970
Sex (20)			
Male	62	62	65
Female	70	68	71
Age (1)			
1-5	73	75	75
6-17	64	58	62
18-34	68	67	70
35-54	64	65	67
55-64	66	68	73
65 and over	68	68	76
Family income (7)			
Low	-- ^a	56	65
Middle	--	64	67
High	--	71	71
Race (18)			
White	--	-- ^b	70
Non-white	--	--	58
Residence (19)			
SMSA, central city	--	--	65
SMSA, other urban	--	--	72
Urban, non-SMSA	--	--	71
Rural non-farm	--	--	68
Rural farm	--	--	62
Total	66	65	68
^a Not available for 1958.			
^b Not available for 1963.			

Those 18 to 54 with low incomes were also more likely to see a doctor in 1970 than in 1963. The percentage increase among the poor was least for the older people 55 and over. In contrast, among higher income people the only age groups where there were substantial increases were 55 to 64 and 65 and over.

These trends correspond to those which might be expected as a result of the implementation of Medicaid and Medicare in July, 1966. Medicaid and most health center programs begun since 1963 were designed to serve the low income

TABLE 5
Percent seeing a physician during the survey year by age
by family income: 1963 and 1970

AGE (1)	FAMILY INCOME (7)					
	Percent low		Percent middle		Percent high	
	1963	1970	1963	1970	1963	1970
1- 5	52	60	76	73	87	83
6-17	41	49	53	58	70	70
18-34	57	68	67	70	70	71
35-54	54	64	64	65	69	68
55-64	69	71	70	75	66	72
65 and over	68	73	66	85	71	82
Total	56	65	64	67	71	71

population of all ages. Consequently, decreases in the "health utilization deficit" of the poor in younger age groups might be expected. In contrast, the Medicare program was designed to benefit people of all incomes who were 65 and over. Some argue that features of the program such as payment of the physicians on a fee for service basis, deductibles and coinsurance make it primarily a "middle class" program. The increased proportions of middle and upper income elderly seeking care support such an argument.

Table 6 allows us to examine the joint influence of family income, age, and residence on seeing a physician. Income is directly related to the proportion of children seeing a physician regardless of residence. On the other hand, residence, controlling for income, does not seem to be as important, although those urban children living in SMSA's but not the central city show a higher proportion seeing a doctor than children living elsewhere.

Adults 18 to 64 see the doctor in about the same proportions for all income-residence combinations (Table 6). For the low and middle income groups 65 and over, the central city population is least likely to see a doctor. However, among the elderly with high incomes, those living in the central city are *most* likely to see a doctor.

Table 7 shows that the mean number of physician visits per person per year has actually *decreased* over the last twelve years.⁴ This general decrease of about one-half of a physician visit per person took place for both males and females. In each time period the average number of visits per person for females exceeded those for males by almost one visit. Prenatal visits account for a portion of the extra visits by females.

TABLE 6
Percent seeing a physician (14) during the survey year by age
by family income by residence: 1970

AGE (1)	FAMILY INCOME (7)	RESIDENCE (19)			
		Percent SMSA, central city	Percent other urban	Percent rural	Percent total
1-17	Low	49	63	45	51
	Middle	58	67	60	62
	High	72	75	72	73
18-64	Low	71	69	63	68
	Middle	65	71	70	69
	High	66	72	69	70
65 and over	Low	69	74	75	73
	Middle	80	88	90	85
	High	93	78	73	82
All ages	Total	66	72	67	68

The trend between 1963 and 1970 of decreasing mean number of visits per person was true for every age group except for children six to seventeen and adults 55 to 64. Similar differences among age groups are found in each time period (Table 7). The mean number of visits for children from birth to age five is higher than that for children six to seventeen. The latter group has the lowest mean number of visits of any age group. The number of visits among adults increases in the older age groups.

The low income group reports considerably more physician visits than the middle and high income groups (Table 7). This finding for mean number of visits is exactly opposite to the relationship between family income and fact of seeing a physician. In other words the poor appear to be less likely to see a doctor, once they make a physician contact, the volume of services is on average considerably higher. In contrast, the average number of visits for whites exceeds that for nonwhites by one-half of a visit (Table 7). Thus, whites are not only more likely to see a physician but also have a higher mean number of visits.

People living in urban areas see a physician more often than those living in rural areas (Table 7). It might be recalled that the central city dwellers and the rural farm population were least likely to see a doctor during the year according

TABLE 7
Mean number of physician visits per person-year by
selected characteristics: 1958, 1963, and 1970

CHARACTERISTIC	MEAN NUMBER OF PHYSICIAN VISITS (16)		
	1958	1963	1970
Sex (20)			
Male	3.5	4.1	3.6
Female	5.3	5.0	4.5
Age (1)			
0- 5	4.6	4.0	4.2
6-17	2.7	2.5	2.2
18-34	4.1	5.0	4.2
35-54	4.7	4.9	4.0
55-64	5.1	5.7	6.3
65 and over	7.4	8.2	6.4
Family income (7)			
Low	-- ^a	-- ^a	4.9
Middle	--	--	3.9
High	--	--	3.6
Race (18)			
White	--	--	4.1
Non-white	--	--	3.6
Residence (19)			
SMSA, central city	--	--	4.2
SMSA, other urban	--	--	4.2
Urban, non-SMSA	--	--	4.4
Rural non-farm	--	--	3.7
Rural farm	--	--	3.4
Total	4.4	4.6	4.0

^aNot available for 1958 and 1963.

to Table 4. While the rural farm population is also the group with the fewest physician visits, central city dwellers are above average for mean number of visits.

Table 8 allows us to look simultaneously at the effects of income and age on physician visits. The pattern that emerges is very different for children and adults. For children from birth to 17 the mean number of visits rises consistently with increasing income. For the group 18 to 64 the reverse is true. The mean number of visits actually decreases with increasing income. For the elderly the mean number of visits is fairly constant over income groups.

TABLE 8
Mean number of physician visits by age by family income: 1970

AGE (1)	VISITS PER PERSON-YEAR (16)			VISITS PER PERSON SEEING M.D. (17)		
	Low income	Middle income	High income	Low income	Middle income	High income
0- 5	3.2	4.4	4.6	4.0	5.1	5.1
6-17	1.7	2.2	2.4	3.4	3.8	3.3
18-34	5.2	4.2	3.9	7.5	6.0	5.5
35-54	5.1	4.0	3.7	7.8	6.0	5.4
55-64	7.1	6.3	5.5	9.8	8.3	7.5
65 and over	6.3	6.4	6.7	8.6	7.4	7.9
Total	4.9	3.9	3.6	7.3	5.7	5.1

The second half of Table 8 gives the mean number of visits for those persons who actually saw a doctor. This measure allows us to look at mean number of visits controlling for the effect of the proportion of people in a given group who saw a physician. Visits per person seeing a doctor is relatively higher for the low income group compared to the rest of the population than are mean number of visits for the population as a whole. Thus, for children who actually saw a doctor, there is less of a deficit for the low income groups than there appeared to be when looking at visits per person-year. For adults in every age group, the mean number of visits per person seeing the doctor is considerably higher for the low income group than for the upper income groups.

Table 9 shows age-income relationships to physician visits for both whites and nonwhites. Not controlling for age, mean number of visits per person-year is greater for whites than for nonwhites for every income group. However, when

we look within age groups we find this not to be the case. Low income, nonwhite adults see the doctor more often than do low income white adults. The mean number of visits per person-year, however, continues to be higher in the white population for all children and adults in the higher income groups.

The second half of Table 9 shows the volume of visits for those people seeing a doctor. The relative use of nonwhites compared to whites increases when contrasted with the findings for visits per person-year. For low income people of all ages the mean number of visits for the nonwhites exceeds that for whites. For the middle and high income groups, however, the mean number of visits per person seeing the doctor continues to be higher for the whites than for the nonwhites. The mean number of visits per person seeing a doctor not considering age and income is very similar for the whites and nonwhites.

TABLE 9
Mean number of physician visits by age by family income
by race: 1970

AGE (1)	FAMILY INCOME (7)	VISITS PER PERSON-YEAR (16)		VISITS PER PERSON SEEING M.D. (17)	
		White	Non-white	White	Non-white
0-17	Low	2.3	1.7	3.6	3.8
	Middle	3.0	1.9	4.4	3.3
	High	3.0	1.5	4.0	1.9
18-64	Low	5.6	6.1	8.1	9.3
	Middle	4.5	3.6	6.5	5.6
	High	4.0	2.9	5.7	5.2
65 and over	Low	6.0	8.8	8.2	11.9
	Middle	6.1	-- ^a	7.1	-- ^a
	High	6.8	--	8.0	--
All ages	Low	5.0	4.4	7.2	7.7
	Middle	4.0	3.1	5.7	5.0
	High	3.7	2.3	5.1	3.7
Total		4.1	3.6	5.8	6.0

^aBased on fewer than 25 unweighted observations.

C. Hospital Care

In some respects the monitoring of general hospital services use by the population is more crucial than the monitoring of physicians' services. This is because of the serious nature of illnesses treated in the hospital and the extraordinary expense of hospital services.

Table 10 shows that in 1970 hospital services were not spread evenly over most population groups. Only within the sex category do we find similar usage for the subgroups examined. Hospital use rises rapidly with age, particularly if we exclude hospital care related to pregnancy as is done in this table. Low income groups are considerably more likely to use hospital days than is true of the higher groups. In contrast, a greater proportion of the white population than the nonwhite population spent time in the hospital in 1970. Finally, with respect to residence we find the urban dwellers in SMSA's and the rural farm population less likely to have used a hospital day in 1970 than the urban non-SMSA and rural non-farm population.

The lower use by the people living in SMSA's and on rural farms appears to be a low and middle income phenomenon which is not found for the high income population (Table 11). We find, however, that low income people are more likely to have been in the hospital than other people regardless of the type of locality in which they live.

Table 12 provides a view of trends for a more traditional measure, hospital admissions per hundred person-years, over the entire span of years covered by the four national studies. These trend data show that there has been a continual rise in hospital admissions during this seventeen year period. The increase has been experienced by both males and females. The female rate includes admissions for pregnancies and is in each time period considerably greater than that for males.

The increase in admissions for different age groups over the time spanned by these studies has not been uniform. The traditional pattern is relatively low rates of admission for children; relatively high rates in the 18 to 34 category which includes most pregnancy admissions; a drop-off in the middle years; and an increase in aged population. Although this general pattern exists in each time period, trend data suggest that most of the overall increase in admission rates has been accounted for by the older age groups, 55 to 64 and 65 and older. While Medicare might account for a portion of the increase for the 65 and over group between 1963 and 1970, it is obvious that this is a trend which had been taking place long before the passage of Medicare and applies not only to those eligible for Medicare but also to those in the age group 55 to 64. A shorter term trend which should be pointed out between 1963 and 1970 is the increase in admission rates for children from birth to five years old.

Table 12 also suggests some rather definite changes in the relationship between income and admission over time. The 1953 study showed a relatively

TABLE 10
Percent in the hospital one or more days during the survey year
by selected characteristics: 1970

CHARACTERISTIC	PERCENT IN HOSPITAL (9)
	1970
Sex (20)	
Male	9
Female	9
Age (1)	
0-17	6
18-54	9
55 and over	16
Family income (7)	
Low	12
Middle	9
High	8
Race (18)	
White	9
Non-white	7
Residence (19)	
SMSA, central city	8
SMSA, other urban	9
Urban, non-SMSA	11
Rural non-farm	10
Rural farm	9
Total	9

flat distribution over all income groups. In 1958 the lower income groups tended to have higher admission rates. The latter two studies have accentuated this trend so that by 1970 the lowest income groups had a hospital admission rate of about twice that of the highest income groups. Medicare and Medicaid may well account for some of these basic changes. However, again it should be pointed out that the changes we are observing were beginning to take place before the passage of these programs.

TABLE 11
Percent in the hospital (9) one or more days during the survey year
by residence by income: 1970

RESIDENCE (19)	FAMILY INCOME (7)			
	Percent Low	Percent Middle	Percent High	Percent Total
SMSA, central city	10	7	8	8
SMSA, other urban	11	11	7	9
Urban, non-SMSA	14	12	9	11
Rural non-farm	13	10	7	10
Rural farm	11	8	8	9
Total	12	9	8	9

The admission rate for the white population exceeded that for the nonwhite in 1970 (Table 12). Despite the relatively high correlation between income and race, there are different relations between each characteristic and admissions: low income people have high admission rates but nonwhites (who also tend to be low income) have relatively low admission rates. The younger mean age of the nonwhite population accounts for part of this discrepancy.⁵

Over time the most consistent relationship between residence and hospital admissions has been the high rate for the rural non-farm population and the relatively low rate for the population living in the large urban areas (Table 12). Between 1963 and 1970 the main increases appeared in the large urban and rural farm areas.

Table 13 shows the joint effect of age and income on hospital admissions in 1963 and 1970. In 1963, for children under 18 the admission rate increased as income increased. By 1970, however, due to substantial increases in admission rates among the lower income children, this relationship had reversed itself so that the inverse relationship between income and hospital admissions generally true in the population was also found for children under 18. This finding together with those concerning physician visits suggests a considerable shift of medical care services toward low income children in the period from 1963 through 1970.

For adults 18 to 54 the general inverse relationship between income and admission rates held in both 1963 and 1970 (Table 13). For those 55 and over differences according to income are apparently becoming less distinct with the passage of time.

TABLE 12

Hospital admissions per 100 person-years by selected
characteristics: 1953, 1958, 1963 and 1970

CHARACTERISTIC	HOSPITAL ADMISSIONS PER 100 PERSON-YEARS (8)			
	1953	1958	1963	1970
Sex (20)				
Male	9	9	10	11
Female	15	15	15	16
Age (1)				
0- 5	8	10	8	11
6-17	8	6	6	6
18-34	16	20	19	20
35-54	12	11	14	12
55-64	12	10	17	20
65 and over	13	18	18	22
Family income (7)				
\$ 0- 1,999	12	14	16	19
2,000- 3,499	12	12	12	16
3,500- 4,999	12	14	12	17
5,000- 7,499	12	12	14	16
7,500- 9,999	} 11	} 10	14	15
10,000-12,499			11	12
12,500-14,999			} 10	11
15,000-17,499				11
17,500 and over				9
Race (18)				
White	-- ^a	-- ^a	-- ^a	14
Non-white	--	--	--	11
Residence (19)				
Large urban	10	11	10	12
Other urban	11	14	13	14
Rural non-farm	14	14	15	15
Rural farm	12	13	11	14
Total	12	12	13	14

^aNot available for three earlier studies.

TABLE 13
Hospital admissions (8) per 100 person-years by income by age:
1963 and 1970

FAMILY INCOME (7)	AGE (1)					
	0-17		18-54		55 and over	
	1963	1970	1963	1970	1963	1970
\$ 0- 1,999	5	11	20	27	21	20
2,000- 4,999	6	8	15	22	14	19
5,000- 9,999	7	9	19	18	19	23
10,000-14,999 } 15,000 and over }	7	4 } 5 7 }	12	15 } 13 9 }	15	23 } 21 19 }
Total	7	7	16	16	18	21

D. Surgical Procedures

Treatment by hospitalized surgery represents a substantial part of the health services delivered in this country. Surgical admissions account for over one-third of all admissions to short term general hospitals. Surgical rates have potential value for monitoring the population's use of services, given the concern in this country about the performance of "unnecessary" surgery. In addition, there is consternation that some population groups are not getting "necessary" surgery.

Table 14 indicates that in-hospital surgical procedure rates increased in 1970 compared to the rates of 1958 and 1963. This was true for both sexes with females continuing to have a higher rate than males.¹⁶

In each time period the surgical rates were generally higher in the older age groups than in the younger age groups (Table 14). Considering the entire twelve year period, the most consistent increases appear to have occurred for adults 18 to 64. Between 1963 and 1970, however, our data suggest an increase at both ends of the age continuum: children and the elderly.

The findings from each of the three studies have shown relatively low rates for surgical procedures in the highest income groups (Table 14). Between 1963 and 1970 the increase seems to have been largely accounted for by increasing surgical procedure rates in the lower income groups. Thus the overall pattern in 1970 is somewhat different than it was in 1963. The lowest income groups in 1970 have the highest general hospital admission rates for surgery while in 1963 the lowest income groups had a rate very similar to that of the highest income groups.

White, nonwhite differences in surgical procedure rates appear negligible in Table 14. The differences according to residence also appear to be small. In earlier time periods the rural farm population appeared to have a considerably lower rate but this no longer appears to be the case.

E. Obstetrical Care

A traditional measure of preventive medicine is the use of physicians' services by pregnant women. A commonly accepted norm is that a visit should be made to a physician during the first trimester of the pregnancy. Table 15 shows the proportion of mothers having live births during each of the survey years who saw a doctor in the first trimester. This proportion increased in each successive study, but rate of increase has not been consistent for all income and education categories.

With respect to income, we see in Table 15 that, over the seventeen year period, major increases in the proportion of pregnant women seeing a physician by the end of the first trimester have been made by the low and middle income groups. In contrast, the proportion among the high income women has remained relatively stable over this time period. Similar trends are apparent with respect to education; that is, major increases have been made by the women with less education while physician visits for more highly educated mothers actually have decreased slightly (using this measure). The results of these two trends are that by 1970 we find much smaller differences by income and education categories. In fact, it is no longer clear that the highest income and education groups are most likely to see a physician by the end of the first trimester.

Table 15 does suggest that differences do exist with respect to residence. Expectant mothers in the central cities are least likely to see a physician during the first trimester. In contrast, those women living in urban but non-SMSA areas, and those living in rural areas but not on farms appear most likely to see a physician by the end of the third month of pregnancy.

F. Dental Care

For the purposes of monitoring the public's use of health services, dental care provides a marked contrast to most of the other services we have examined. It is generally viewed by the public as more "elective" and less "necessary" than physicians' services. However, by most objective standards the level of unmet need for dental care is high, possibly even higher than for physicians' services. Dental care is also a service paid for largely out of pocket by the consumer with only very limited coverage by third party payers.

Table 16 shows a consistent increase in the proportion of the population seeing a dentist in each period from 1953 through 1970. While this proportion has been increasing for both males and females, the relative increase appears to

TABLE 14
In-hospital surgical procedures per 100 person-years by selected
characteristics: 1958, 1963, and 1970

CHARACTERISTIC	PROCEDURES PER 100 PERSON-YEARS (21)		
	1958	1963	1970
Sex (20)			
Male	4	4	5
Female	5	6	7
Age (1)			
0- 5	3	3	5
6-17	4	4	3
18-34	5	5	7
35-54	5	6	6
55-64	5	6	8
65 and over	7	5	7
Family income (7)			
Under \$2,000	5	3	7
2,000- 3,499	4	4	6
3,500- 4,999	5	4	7
5,000- 7,499	5	6	7
7,500- 9,999		7	5
10,000-12,499		5	6
12,500-14,999	4	4	5
15,000-17,499			4
17,500 and over			5
Race (18)			
White	-- ^a	-- ^a	6
Non-white	-	-	5
Residence (19)			
Large urban	5	5	6
Other urban	5	5	6
Rural non-farm	5	6	5
Rural farm	3	4	5
Total	5	5	6

^aNot available for 1958 and 1963.

TABLE 15
Percent of women having live births who saw a doctor in the first
trimester of pregnancy by family income level, education of
mother, and residence: 1953, 1958, 1963, and 1970

INCOME, EDUCATION AND RESIDENCE	PERCENT SEEING PHYSICIAN BY END OF FIRST TRIMESTER (15)			
	1953	1958	1963	1970
Income (7)				
Low	42	67	58	71
Middle	66	77	86	92
High	89	86	88	85
Education (6)				
Eight grades or less	42	57	68	72
Some high school	58	75	88	85
Completed high school	72	79	80	89
Some college	90	88	88	81
Residence (19)				
SMSA, central city	-- ^a	-- ^a	-- ^a	76
SMSA, other urban	--	--	--	85
Urban, non-SMSA	--	--	--	100
Rural non-farm	--	--	--	90
Rural farm	--	--	--	-- ^b
Total	65	77	80	85

^aNot available for earlier studies.

^bBased on fewer than 25 unweighted observations

have been greater for males. By 1970 the traditional discrepancy between the sexes—with females being more likely to see a dentist—had largely disappeared.

The unusual nature of dental care compared to other medical services is best pointed out by the established pattern among the age categories in percent seeing a dentist. The so-called "inverted U" pattern can be noted in each age period with the youngest and oldest age groups least likely to see a dentist. Over the seventeen year time period there was an increase in the proportion seeing a dentist in each age category. However, the rate of increase, particularly in the period from 1963 to 1970, was greatest among those groups least likely to see a

TABLE 16
Percent seeing a dentist during the survey year by selected
characteristics: 1953, 1963, and 1970

CHARACTERISTIC	PERCENT SEEING A DENTIST (4)		
	1953	1963	1970
Sex (20)			
Male	31	36	44
Female	36	40	46
Age (1)			
1- 5	10	12	21
6-17	44	47	56
18-34	44	46	52
35-54	39	43	46
55-64	25	32	34
65 and over	13	19	26
Family income (7)			
\$ 0- 1,999	17	16	23
2,000- 3,499	23	25	23
3,500- 4,999	33		33
5,000- 7,499	44	40	35
7,500- 9,999			44
10,000-12,499	56	58	51
12,500-14,999			50
15,000-17,499			53
17,500 and over			67
Race			
White	- ^a	- ^a	47
Non-white	-	-	24
Residence (19)			
SMSA, central city	-	-	41
SMSA, other urban	-	-	54
Urban, non-SMSA	-	-	45
Rural non-farm	-	-	41
Rural farm	-	-	40
Total	34	38	45

^aNot available for 1953 and 1963.

dentist. Consequently over the seventeen year period the percent seeing a dentist has doubled for the youngest age category and the oldest age category while the increase has been much more modest for the intervening age groups.

The traditional relationship between use of services and income which used to exist for hospital, physician, and dental care exists today only for dental care. Looking at broad income categories, the percent using a dentist has increased for each income group. It is probably true that the relative increase has been greater for the lowest income groups than the higher income groups. Even in 1970, however, tremendous differences still exist. Thus we find a person in the highest income group has a probability of seeing a dentist within a year almost *three* times that of a low income person.

The major discrepancies with respect to income are also found according to race. Table 16 shows that the proportion of whites seeing a dentist is twice that for the nonwhite population. Differences exist with respect to residence, but these are not so large. Still, central city residents and rural residents are less likely to see a dentist than residents of SMSA's not living in the central cities.

Table 17 shows age and income effects simultaneously. For the youngest and oldest age groups, the proportion using a dentist tended to increase between 1963 and 1970 for all income groups. The actual percentage increase tended to be greatest at the upper income levels. In contrast, the proportional increase tended to be greatest for the low income groups. For the other age categories the increases in the seven year period were accounted for almost entirely by the low income groups. In fact, for many of the higher income categories, there appeared to be an actual decrease in the percentage of the group seeing a dentist in 1970 compared to 1963.

Table 18 provides mean number of visits per person per year for selected social and demographic characteristics. There is little in this part of the table which could not have been predicted, knowing the general magnitude of visits. However, when we look at mean number of visits per person seeing a dentist in the second column in the table, there are some new relationships indicated. First, children one to five who do see the dentist have more visits than the visits per person-year might suggest. Further, people 65 and over seeing the dentist have the same number of visits as people in the intermediate age categories.

Among the social characteristics, some of the changes in relative magnitude are even more pronounced. For example, it appears that the mean number of visits for persons seeing a dentist is actually higher for nonwhites than it is for whites. Also, the mean number of visits for low income people who see the dentist is as high as for other income groups. In other words, once these groups get into the system, they appear to consume as much care as other groups. This was also found for physician care and was implied for hospital care. The finding that central city residents reinforces this general trend. The only major population groups not supporting this trend are the rural groups. People in rural

TABLE 17
Percent seeing a dentist during the survey year by age
by family income: 1963 and 1970

AGE (1)	INCOME (7)	PERCENT SEEING A DENTIST (4)	
		1963	1970
1- 5	\$ 0- 1,999	0	4
	2,000- 4,999	4	9
	5,000- 9,999	13	14
	10,000-14,999	23	30
	15,000 and over		29
			30
6-17	0- 1,999	11	24
	2,000- 4,999	30	35
	5,000- 9,999	48	53
	10,000-14,999	71	57
	15,000 and over		74
			65
18-34	0- 1,999	31	47
	2,000- 4,999	33	41
	5,000- 9,999	49	43
	10,000-14,999	57	57
	15,000 and over		65
			60
35-54	0- 1,999	23	31
	2,000- 4,999	28	30
	5,000- 9,999	42	38
	10,000-14,999	58	46
	15,000 and over		60
			53
55-64	0- 1,999	16	20
	2,000- 4,999	25	27
	5,000- 9,999	32	29
	10,000-14,999	52	44
	15,000 and over		44
			44
65 and over	0- 1,999	12	16
	2,000- 4,999	18	18
	5,000- 9,999	24	35
	10,000-14,999	39	48
	15,000 and over		50
			49

TABLE 18
Mean number of dentist visits by selected characteristics: 1970

CHARACTERISTIC	VISITS PER PERSON-YEAR (2)	VISITS PER PERSON SEEING A DENTIST (3)
Sex (20)		
Male	1.3	3.0
Female	1.5	3.4
Age (1)		
1- 5	.5	2.2
6-17	1.7	3.1
18-34	1.6	3.2
35-54	1.6	3.5
55-64	1.1	3.4
65 and over	.8	3.3
Race (18)		
White	1.5	3.2
Non-white	.8	3.5
Family income (7)		
Low	.9	3.2
Middle	1.2	3.0
High	1.9	3.3
Residence (19)		
SMSA, central city	1.4	3.4
SMSA, other urban	1.8	3.5
Urban, non-SMSA	1.3	3.0
Rural non-farm	1.1	2.8
Rural farm	1.1	2.7
Total	1.4	3.2

areas were less likely to see a dentist. Those who do see a dentist from rural areas also have a smaller mean number of visits.

G. Utilization According to Medicaid Benefits in State of Residence

Table 19 examines the utilization experience of the population according to the level of Medicaid benefits in their state of residence and family income. Two gross measures of Medicaid benefits were developed:

1. "Access" is defined in terms of the proportion of the total state population who are recipients (either authorized or unauthorized) of Medicaid benefits;
2. "Payment" is based on average monthly payment per recipient.

The percent of low income people seeing a physician in states with varying Medicaid benefits is fairly similar (Table 19). Further, regardless of the nature of state Medicaid benefits, the low income group has physician use rates similar to people with higher incomes (Tables 19).

Regardless of the level of Medicaid benefits, the percent of hospitalizations in the low income group exceeds that of other income groups (Table 19). The largest difference evident in the hospital table does not differentiate low income people from other people, rather, it indicates that those states with high payments tend to have low percentages of their population in the hospital. This suggests underlying differences between states with low and high payments rather than the effects of the Medicaid program per se. The high payment states also tend to be the high income states and, as we have seen in earlier sections of this report, high income tends to be inversely related to hospital utilization.

The final section of Table 19 shows the population's utilization of dentists with respect to the Medicaid benefits. The greatest differences between the low income people and the rest of the population tend to exist in those states with high Medicaid payments. In these states the overall use of dentists tends to be higher than in states with low Medicaid payments. As was the case with hospital care, what we are probably seeing here is not so much the effects of the Medicaid program as social and economic differences between states funding different types of Medicaid programs.

H. Disability Days and Physician Contacts

Of central concern for policy purposes is the population's use of medical care in relationship to some measure of illness level or "need" for health services. While it is extremely difficult to define and measure "need", one gross measure which has been used in social surveys which has shown some discriminatory power is disability days⁷—days during which people reported they stayed in bed or were otherwise unable to carry on their usual activities because of illness or injury.

In this section we have abstracted some of the main findings of the first preliminary report concerning disability days and physician contacts during the two weeks immediately preceding the interviews, all of which were done in

TABLE 19					
Percent of people using physicians, hospitals, and dentists by Medicaid benefits in state of residence by family income: 1970					
MEDICAID BENEFITS		FAMILY INCOME			
Access (10)	Payment (11)	Low	Middle	High	Total
Percent seeing a physician during 1970 (14)					
Low	Low	67	69	68	68
High	Low	65	67	72	68
Low	High	62	68	71	68
High	High	70	68	73	71
Percent in hospital during 1970 (9)					
Low	Low	12	10	10	11
High	Low	13	10	8	10
Low	High	11	10	6	8
High	High	10	9	8	8
Percent seeing a dentist during 1970 (4)					
Low	Low	31	38	57	42
High	Low	24	40	51	40
Low	High	27	44	58	47
High	High	32	42	60	48

early 1971.⁸ The main social policy emphasis in this report was on differences according to income, residence and race.

Table 20 suggests that whites are more likely to report disability than blacks regardless of residence or income. Detailed tables from the report showed that the greater probability of experiencing disability on the part of whites is explained entirely within the age groups 17 and under. For example, 16.3 percent of white children one to five were reported to have experienced disability compared to only 9.5 percent of the blacks, and for those 6 to 17 the

TABLE 20^aDisability days during a two-week period by income, residence and race: 1971^b

Family Income (7)	Residence (19)	Race (18)	Percent with one or more disability days (5)	Mean number of disability days for those with disability (5)
Non-poor	Urban	White	17	4.9
Non-poor	Urban	Black	17	4.5
Non-poor	Rural	White	16	5.2
Non-poor	Rural	Black	7	^c
Poor	Urban	White	22	6.6
Poor	Urban	Black	15	6.8
Poor	Rural	White	20	6.5
Poor	Rural	Black	18	6.4

^aRevision of Table B, page 11, in Andersen and Kravits *op. cit.*^bExcludes infants under one year old^cBased on fewer than 25 unweighted observations

percentages are 19.4 and 11.9 respectively. In contrast, among adults, blacks are more likely to report disability. This is particularly true of low income blacks. Except for urban blacks, the poor groups appear more likely to experience disability given similar residence and race. However, age again plays an important part in this apparent relationship according to the detailed tables. Relatively more non-poor than poor children are actually reported to have experienced disability. Among adults, however, a higher proportion reporting disability among the low income group results in a higher overall rate for the poor.

The greater proportion of white and non-poor children with reported disability combined with a reversed relationship for adults suggests the need for methodological studies of possible differences in reporting for children and also examination of differences in conditions of children which result in disability days according to income and race.

The last column of Table 20 shows an important difference in the average number of disability days for persons with disability according to family income. Without exception, low income groups are disabled longer than the higher income groups. Overall, the mean number of disability days for the poverty group is one and one-half days longer.

Table 21 provides a picture of how those people who reported disability in each population group used physicians. The first column indicates considerable homogeneity among the various groups with respect to the percentage of those with disability who saw a doctor. None of the major variables show consistent effects when controlling for the other major variables. It should be noted, however, that an income effect is particularly noticeable for children one to five when the detailed tables are examined. Above the poverty line, 56.0 percent of all children with disability days saw a doctor compared to only 33.8 percent of those children below the poverty line.

The second data column of Table 21 shows the mean number of physician contacts for persons experiencing disability days. The main difference among the groups here appears to be a residential one. People living in urban areas have more physician contacts than those living in rural areas.

The final data column in Table 21 presents the volume of physician care relative to the amount of disability people report. This column is the key data of this section from a policy standpoint since its purpose is to look in some gross fashion at medical care relative to "need." The results are quite conclusive. The

TABLE 21^a

Contacts with physicians by people with disability days during
two week period by income, residence, and race: 1971^b

Family Income (7)	Resi- dence (19)	Race (18)	Percent with disability contacting a physician (13)	Mean number of physician contacts for persons with disability (13)	Physician contacts/100 disability days (13)
Non-poor	Urban	White	44	0.8	17
Non-poor	Urban	Black	36	0.8	17
Non-poor	Rural	White	41	0.7	14
Non-poor	Rural	Black	c	c	c
Poor	Urban	White	33	0.8	12
Poor	Urban	Black	40	0.7	11
Poor	Rural	White	39	0.6	9
Poor	Rural	Black	37	0.6	9

^aRevision of Table C, page 14 in Andersen and Kravits, *op. cit.*

^bExcludes infants under one year old

^cBased on fewer than 25 unweighted observations

non-poor population has considerably more physician contact per 100 disability days than does the poor population. Examination of the detailed tables shows that these differences are found in every age group and are especially large for the very young and the elderly. Though not so strong as that of income, another apparent effect is that resulting from residence. The urban population consistently has more physician contacts per 100 disability days than does the rural population. There is no apparent difference in physician contacts per 100 disability days according to race. Thus, poor and the rural population have fewer physician visits per 100 disability days but race *per se* does not appear related to this measure.

SUMMARY AND CONCLUSIONS

The data contained in this report highlight some of the major policy issues concerning the distribution of health services in the United States. They present a mixed picture of the nation's success in obtaining a more equitable distribution of health care among various social groups. Findings from this report which support the view that the United States is attaining equalization of health care opportunity include:

1. The gap between the percentage of low and high income people seeing a physician during the year narrowed considerably between 1963 and 1970. Most of the change was accounted for by an increase in the percentage of low income children and young adults seeing the doctor.
2. The increase in the proportion of the population seeing a doctor between 1963 and 1970 among all age groups was greatest for the elderly.
3. Once they see a physician, low income people average *more* visits than those of higher income.
4. For those people seeing the doctor, the mean number of visits by non-whites is almost as great as the mean for whites and the mean number for central city residents exceeded the national average.
5. The lowest income people are almost twice as likely to be admitted to a hospital as those with the highest incomes in 1970 while in 1953 the admission rates were much the same for all income groups.
6. In 1953, the chances that pregnant women in the lowest income and education classes would see a doctor in the first trimester of pregnancy were less than one-half the chances for women with a college education and high family incomes. By 1970 most pregnant women, regardless of income or education, were seeing a doctor during the first trimester.
7. By 1970 the mean number of dental visits for persons seeing the dentist did not differ greatly according to income or race.
8. There was little difference in use of physicians in response to reported disability by blacks and whites.

However, findings which contradict this picture of equalization of health care opportunities include:

1. Low income people, non-whites, and central city residents were considerably more likely than the rest of the population to have no regular source care in 1971. Further, among people reporting a clinic as their regular source of care, the above groups are much less likely to see a particular doctor at the clinic.
2. A smaller proportion of the children living in central cities and rural areas see a doctor than is true for other children in the population.

3. The rural farm population is not only less likely to see a physician than the rest of the population, but also those who do see a doctor have fewer visits.
4. Although non-whites and central city residents have longer lengths of stay once they are admitted to the hospital, their admission rates were still lower than that for the rest of the population in 1970.
5. Expectant mothers in the central cities are less likely to see a physician during the first trimester of pregnancy than were pregnant women living elsewhere.
6. Large differences still exist in the percent of the population seeing a dentist by income and race. The highest income group is three times as likely to see a dentist during a year's period as is the lowest income group. Whites are twice as likely as are non-whites to see a dentist.
7. The poor report more disability days than the non-poor and, along with the rural population, have considerably fewer physician contacts in response to their disability than the rest of the population.

In conclusion we suggest that while great improvements in health care for disadvantaged groups have occurred over the last ten to twenty years, these groups are still not equal to the remainder of the population. In fact, in order to be "equal" they may well have to *exceed* higher income groups in their use of services to compensate for a greater rate of illness and disability. This proposition will be explored further in future reports, including an analysis of the diagnoses which brought various income and racial groups to use physician, hospital and dental care.

REFERENCES

- ¹ All of these studies have been conducted by the Center for Health Administration Studies and the National Opinion Research Center of the University of Chicago. The current study is funded through a contract with the National Center for Health Services Research and Development [HSM 110-70-392]. The first three studies are described in Ronald Andersen and Odin W. Anderson, *A Decade of Health Services: Social Trends in Use and Expenditure*, Chicago: University of Chicago Press, 1967.
- ² The basic tables in this report include those jointly selected by the National Center for Health Services Research and Development and the Center for Health Administration Studies as being the tables on utilization patterns which had top priority from the standpoint of public policy issues and problems.
- ³ This report, together with a previous report—Ronald Andersen and Joanna Kravits, "Disability Days and Physician Contact for the Two Week Period Preceding the Interview Date by Age, Sex, Race, Residence and Family Income," Center for Health Administration Studies, September 28, 1971—and a report on expenditures and third party payers (still to be submitted), constitute the reports referred to as "preliminary reports" in the contract. Subsequent reports to be completed in 1973 which will provide more detailed analysis and methodology and will incorporate data from the verification studies of physicians, hospitals and insuring organizations will constitute the "final report" as referred to in the contract.
- ⁴ This downward trend is particularly noteworthy for people 65 and over since the enactment of Medicare in 1966 which removed financial barriers to physician visits once a deductible had been met might have been expected to result in an increased rather than a decreased mean number of physician visits for this age group.
- ⁵ It should be noted that although relatively fewer nonwhites have hospital admissions, once hospitalized relatively more report large numbers of hospital days than do whites of the same age and sex. National Center for Health Statistics, *Differentials in Health Characteristics by Color*, Series 10, No. 56, October, 1969, pp. 20-22. Comparable data from this study are not available for this preliminary report.
- ⁶ Caesarean sections are considered as surgical procedures while normal deliveries are not.
- ⁷ See, for example, National Center for Health Statistics, *Disability Components for an Index of Health*, Series 2, No. 42, 1971.
- ⁸ Andersen and Kravits, *op. cit.* This report was originally prepared with preliminary data. Since that time updated tables using the final data have been

constructed by the Health Services Research and Training Program, Purdue University, Robert L. Eichhorn, Director, under a contract with the National Center for Health Services Research and Development (HSM-110-71-150). While the final tables do not differ substantially from the preliminary ones, all statistics presented in this section are taken from the updated tables.

METHODOLOGICAL APPENDIX

The specific methodology employed in the earlier studies has been described in an earlier report.¹ Considerable attention was devoted to making the 1971 study as comparable as possible to the previous studies. Modifications were introduced only when resulting gains seemed to more than compensate for the loss in comparability. Such modifications are mentioned in the description of the research method that follows. This appendix includes separate sections on variable definitions, sample design, estimating procedures, and factors influencing sample estimates.

A. Definition of Variables

The following definitions apply to the 1970 data. Reference to definitions used in earlier studies is made when they vary from the current definitions in ways which might influence the comparability of results.

1. Age: as of December 31, 1970.
2. Dentist visits, mean number of per person-year: based on response to question, "Did (PERSON) have any dental care such as teeth cleaned, X-rayed, filled or pulled, or any bridge work done last year?" and the follow-up question, "How many times did (PERSON) visit a dentist's office during the past year?" Person-years were computed by summing the total months by sample members in the population universe during the survey year and dividing this sum by 12. The purpose of this base is to adjust for sample members who were not in the population the entire survey year, such as those who died, were institutionalized, or were born during the year.
3. Dentist visits, per year for persons seeing the dentist: based on the same questions as 2. The base in this case includes only those persons who had at least one dentist visit during the survey year.
4. Dentist, percent seeing: proportion of the sample seeing the dentist at least once during the survey year. This variable excludes all persons who were not in the universe for all 12 months of the survey year.
5. Disability days: sum of days reported in response to the questions: "Within the last two weeks, how many days did (PERSON) stay in bed all or part of the day because (he/she) was not feeling well?" and (Apart from the days (PERSON) stayed in bed) how many days within the last two weeks was (PERSON) not able to do the things (he/she) usually does because (he/she) was not feeling well?"

6. Education of mother: based on response to question, "What is the highest grade or year (PERSON) has completed in school?" Interviewers were instructed, "Do not include trade school, business colleges, correspondence courses and the like."
7. Family income: total family income before taxes for the survey year. Income from wages, salaries, own business or farm, professional work or trade, pensions, rents, welfare agencies, unemployment compensation, alimony, regular contributions from friends or relatives, dividends, interest and similar sources are included. Income in kind—the value of free rent or non-cash benefits—is excluded. In this study, data on income were obtained through a series of questions covering the earned and unearned income of each person 14 years of age and older in the family. Total family income is the sum of these components.

"Low," "Middle" and "High" designations of family income were altered in each study to adjust for inflation. The following income ranges were used in each time period:

INCOMES REPRESENTED BY EACH FAMILY INCOME LEVEL			
YEAR	Low	Middle	High
1953	\$0 - 2,999	\$3,000 - 4,999	\$ 5,000 and over
1958	0 - 3,499	3,500 - 5,999	6,000 and over
1963	0 - 3,999	4,000 - 6,999	7,000 and over
1970	0 - 5,999	6,000 - 10,999	11,000 and over

The poor/non-poor distinction was based upon Bureau of Labor Statistics figures defining as "poor" those persons with family incomes equal to or below the "near poverty" figure described in Footnote 3, page 34. This figure differs from the definition of low income used above in that it is adjusted for family size.

8. Hospital admissions per 100 person-years: overnight stay in or surgery performed in hospitals classified as general or special short term by the American Hospital Association and in hospitals not listed by the A.H.A. but not clearly long term. Excluded are admissions to hospitals classified as general or special long term, mental and allied, and tuberculosis hospitals. Only admissions beginning during the survey year are included. The delivery admission for an obstetrical case is counted as one admission for the mother and none for the infant. If the infant stays in the hospital after the mother goes home or if the infant is readmitted after being discharged, a separate admission is counted for the infant.

Person-years is defined in 2. Hospital admissions for 1970 are not totally comparable to those from earlier studies since the 1970 estimates are based only on the social survey responses while the earlier estimates also incorporate the responses from hospitals in the verification of reported hospitalizations. In 1963, the overall effect of the hospital verification was to reduce the total number of reported admissions by four percent.

Because of more complex verification procedures in the 1970 study, however, more hospital stays *not* reported by the respondent have been discovered than in the 1963 study. The final report incorporating verification data will determine whether admissions will be reduced for 1970.

9. Hospital days, one or more during the survey year: proportion of people spending one or more days in a general or special short-term hospital during the survey year. Excludes days associated with deliveries and other pregnancy-related admissions. Includes days where the admission began in 1969 and carried over until 1970.
10. Medicaid benefits, access: based on mean number of monthly Medicaid recipients (authorized and unauthorized) per 100 population by state. An authorized recipient is one who receives a welfare check for all or part of his support in addition to medical benefits. An unauthorized recipient receives medical benefits only. It is this latter group who were the primary beneficiaries of the Medicaid legislation since authorized recipients received medical care in most states as part of being welfare recipients even before the Medicaid legislation was enacted.

Number of recipients was calculated from "Medical Assistance (Medicaid) Financed Under Title XIX of the Social Security Act," National Center for Social Statistics Report B-1, 2/70, 5/70, 8/70, 11/70. The recipients for the months of February, May, August, and November were averaged for each state and divided by the state population as reported in *Current Population Reports*, U.S. Bureau of the Census, Series P-25, No. 461, June 28, 1971. A recipient is defined as someone who received medical care which was paid for during the month in question.

A sample member was coded as living in a state with "low access" if the mean number of recipients per month was less than 2.8 per 100 population. He was coded as living in a state with "high access" if the mean was equal to or greater than 2.8. There were primary sampling units from 39 states in the sample with access codes assigned as follows:

LOW ACCESS (22 STATES)

Arizona	Maryland	New Mexico
Connecticut	Michigan	North Carolina
Florida	Minnesota	North Dakota
Idaho	Montana	Oregon
Indiana	Nebraska	Pennsylvania
Iowa	New Hampshire	South Carolina
Louisiana	New Jersey	Wisconsin
Maine		

HIGH ACCESS (17 STATES)

Alabama	Kansas	Oklahoma
Arkansas	Kentucky	Tennessee
California	Massachusetts	Texas
District of Columbia	Missouri	Utah
Georgia	New York	Washington
Illinois	Ohio	

11. Medicaid benefits, payment: based on mean monthly payment per Medicaid recipient (authorized and unauthorized) by state. Mean payment was calculated from the same sources given in 10 by computing the mean total payment by state over the months of February, May, August, and November and dividing by the average number of recipients per month by state.

A sample member was coded as living in a state with "low payment" if the mean payment per recipient per month was less than \$71. He was coded as living in a state with "high payment" if the mean was equal to or greater than \$71. On this basis sample members were assigned codes based on their state of residence as follows:

LOW PAYMENT (22 STATES)

Alabama	Kentucky	North Carolina
Arizona	Maine	Ohio
Arkansas	Missouri	Oregon
District of Columbia	Montana	South Carolina
Florida	Nebraska	Tennessee
Georgia	New Hampshire	Texas
Iowa	New Mexico	Washington
Kansas		

HIGH PAYMENT (17 STATES)

California	Maryland	North Dakota
Connecticut	Massachusetts	Oklahoma
Idaho	Michigan	Pennsylvania
Illinois	Minnesota	Utah
Indiana	New Jersey	Wisconsin
Louisiana	New York	

12. Medical care, regular source: based on response to question, "Is there a particular medical person or clinic (PERSON) usually goes to when sick or for advice about health?" and the follow-up question, "Is that a clinic, a regular family doctor, some type of specialist, a chiropractor, or what?" The following codes were assigned:

"MD"—name of medical person given by family listed in A.M.A. directory or name not found in A.M.A. or A.O.A. directory but family classifies person as a "regular family doctor or some kind of specialist."

"Clinic"—family designates "clinic" rather than an individual practitioner. Within the "clinic" category further distinction is made according to an additional follow-up question, "Does (PERSON) go to a particular doctor at this clinic?" with responses signifying the following:

Yes—particular doctor's name given
No—no particular doctor indicated

"Osteopath"—individual name listed in the *Yearbook and Directory of Osteopathic Physicians* or individual name not found in A.M.A. or A.O.A. directory but family classifies individual as "osteopath."

"Other care"—family classifies regular source of care as chiropractor or other practitioner such as a visiting nurse, Christian Science practitioner, homeopath, podiatrist, naturopath or anyone else without a formal medical degree who gives health care.

"No regular care"—family indicates that there is no "particular" medical person or clinic that individual usually goes to when sick or for advice about health.

13. Physician contact: based on response to question: "Within the last two weeks did (PERSON) visit or talk on the phone to a doctor about (his/her) health? and the follow-up question, "How many times?"
 14. Physician, percent seeing: proportion of the sample with at least one physician visit as defined in 16 during the survey year. Excluded are all persons not in the universe for all 12 months of the survey year.
 15. Physician visit by end of first trimester: based on response to question for live births during survey year, "How many weeks had (MOTHER) been pregnant before seeing a doctor in connection with this pregnancy?" If the doctor was reported to have been seen within 13 weeks it was considered "by end of first trimester."
 16. Physician visits, mean number per person year: sum of all visits related to hospitalized illness, other major nonhospitalized illness, pregnancy, other minor illness and routine checkups, shots, test, and ophthalmologist visits for the survey year. Includes seeing either a doctor or osteopath or his nurse or technician at the following sites: patient's home; doctor's office or private clinic; hospital outpatient department or emergency room; industrial, school camp or college health service; and any other clinic such as a board of health clinic or neighborhood health center. Excluded are telephone calls and visits by a doctor to a hospital inpatient. Person-year is defined in 2.
 17. Physician visits, mean number for persons seeing a doctor: average number of visits for sample members who had at least one visit as defined in 16 during 1970.
 18. Race: each family member is coded according to the race of the main respondent. The census definitions of white and non-white are used. People of Mexican or Spanish descent are coded "white." American Indians and Orientals are coded as "non-white."
- Exceptions to the above categories are the definitions "black" and "white" used in Tables 20 and 21. "White" in these two tables excludes families of Mexican or Puerto Rican descent. "Black" excludes American Indians and Orientals from the more general "non-white" category.
19. Residence: classification of the residence of each person in the sample according to U.S. Census designation of the locality in which the residence is located plus the interviewer's description of the dwelling unit and locality. Two classifications are used: the first applies only to the 1970 study while the second applies to all the studies.

a. 1970 CLASSIFICATION

- 1) SMSA, central city—residence in the urban part of a Standard Metropolitan Statistical Area according to the Census which is also designated by the interviewer as "inside the largest city in the primary unit" (NORC's primary sampling units or PSU's).

2) SMSA, non-central city—defined as 1) except interviewer did not describe dwelling as “inside largest city.”

3) Urban, non-SMSA—residence in urban localities which are not part of an SMSA.

4) Rural non-farm—residence in areas defined as rural by the Census which are not described as “farms” by the interviewer.

5) Rural farm—residence in areas defined as rural by the Census which are described as “farms” by the interviewer.

b. CLASSIFICATION USED IN ALL STUDIES

1) Large urban—the urban parts of SMSA’s of one million or more according to the 1950 Census for the 1953 and 1958 studies. The same term was used in the latter two studies to designate urban residences of the ten largest SMSA’s according to the 1960 Census for the 1963 study and according to the 1970 Census for the 1970 study.

2) Other urban—all residences in urban areas not defined as “large urban.”

3) Rural non-farm— } as defined above in a. 4)

4) Rural farm— } and a. 5).

20. Sex: in those few cases where the interviewer did not specify the sex of a sample member, classification was made in the office on the basis of name or other information provided in the interview or the interviewer and/or respondent was contacted again for the correct classification.

21. Surgical procedures, in-hospital per 100 person-years: any cutting procedure (including Caesarean deliveries but not normal deliveries) or setting of a dislocation or fracture performed on a hospital inpatient. Endoscopic procedures, suturing of wounds and circumcision of newborn infants, often classified as surgical procedures, are not so classified in this study. A few exceptions were made when the suturing was so extensive as to require an operating room or blood transfusions.

P *The Sample Design*

The universe sampled in this study was the total, non-institutionalized population of the United States. This universe excludes the following individuals:

- 1) residents in medical, mental, penal, religious, or other institutions who were not residents of a private dwelling at any time during 1970;
- 2) residents on military reservations (the latter three studies included, however, personnel in the armed forces living off base with their families or in other civilian households); and
- 3) transient individuals having no usual or permanent residence.

The NORC master sample used in this study is essentially the same as that used in the 1964 study. Since details concerning this sample have been published in the final report for the previous study, the description here will be limited to the special characteristics of the sample design for the 1971 study.²

The sample in the current study was not a self-weighting area probability sample of the U.S. population. Rather it over represented people of special concern in health policy formulation including those with low incomes living in central cities, the rural population, and persons 66 and over.

In order to obtain a sample with these special characteristics, four separate subsamples were drawn:

- 1) a sample (U) selected from 73 special urban segments in the NORC master sample. These segments were so designated because of the presence of a high proportion of low income urban families according to 1960 Census data;
- 2) a sample (A) selected from the remaining segments in the NORC national probability sample;
- 3) a sample (S) consisting of families either classified as low income or containing a person 66 years or older obtained by screening households in all NORC segments;³ and
- 4) a sample (R) obtained from 30 additional rural primary sampling units drawn especially for this study. Only families thought to be living in rural areas of these PSU's were interviewed. No screening procedure was involved for this sample.

Given the complex sampling design of this study, a weighting scheme must be applied before estimates and tabulations can be produced. Weighting is necessary to correct for the different probabilities of selection among sample observations. Adjustment is also made for the varying completion rates among the various subsamples. A final post-stratification adjustment in the weights was employed to make the sample more closely representative of the actual U.S. population and thus reduce sampling variance. The control factor is the ratio of estimates from the *Current Population Survey*⁴ to estimates based on the NORC sample for some 16 population classes defined by family size, family income, race and whether or not the family dwelling unit is in a Standard Metropolitan Statistical Area.

C. Estimating Procedures

The same general methods of processing the data and deriving estimates for the population were used in 1970 as had been employed in the earlier studies. For cases in which necessary quantitative information was not obtained at all in the interview or in which it was not obtained in sufficiently precise terms, estimates were made by the study staff during the processing stage. In the 1953

study some cases were assigned ultimately to an "indeterminant" category. In the 1958 and 1963 studies, however, all cases were made "determinant" with respect to charges for major categories of goods and services, utilization in these major categories, and family money income. The 1970 procedure was similar to that followed in 1958 and 1963, but in addition, the monetary value of care which had been defined as "free care" in the earlier studies was also estimated. Sources used for estimating included tabulations from the American Medical Association's periodic survey of physicians and the California Medical Association's 1969 Relative Value Study. Chart C-1 provides information on the specific variables used in this report which were in part estimated and also indicates how often these estimating procedures were used.

CHART C-1
Extent to which variables used in this report were estimated

Variable	Type of Estimating Time	Percent of <i>Unweighted</i> Individuals for Whom An Estimate Was Made
Age (1)	This variable was not estimated	
Dentist visits, mean number (2)	If the dentist was seen in 1970 but number of visits was not stated, visits were estimated.	1.1%
Dentist visits, mean per person seeing (3)	Estimated as above.	
Dentist, percent seeing (4)	Less than one-half of one percent of the sample (49 individuals) did not answer this question and were ex- cluded from both num- erator and denomi- nator	

CHART C-1 (continued)

Variable	Type of Estimating Time	Percent of <i>Unweighted</i> Individuals for Whom An Estimate Was Made
Disability days (5)	Excludes individuals not in the universe on the date of the interview and infants under 1 year of age (625) and persons who did not answer either of the disability questions (205)	
Education of mother (6)	Although about one percent of the total sample did not give the highest grade completed in school, this figure was available for all women experiencing a live birth in 1970.	
Family income (7)	All families who did not answer this question had income estimated for them. Earned family income for at least one family member was estimated for 402 families. Other family income was estimated for 268 families.	3.4% earned income 2.3% other income Since some families had both earned and other income estimated, the percentage of families with any portion of their income estimated lies between 3.4 and 5.7 percent.
Hospital admissions (8)	This variable was not estimated.	
Hospital day in 1970 (9)	This variable was not estimated.	

CHART C-1 (continued)

Variable	Type of Estimating Time	Percent of <i>Unweighted</i> Individuals for Whom An Estimate Was Made
Medicaid benefits (10-11)	These variables stem not from the social survey but from outside reference sources.	
Medical care, regular source (12)	Less than one-half of one percent of the sample (25 individuals) did not answer yes or no to whether or not they had a regular source of care. These 25 were excluded from the analysis of this variable. One additional individual who answered "yes" was excluded because he did not know what kind of source it was.	
Physician contact (13)	Excludes all persons excluded in (5) plus those reporting no disability days, plus those with disability days who did not answer to number of physician visits.	
Physician visit by end of first trimester (15)	Four women who did not answer the question and two women who never saw a doctor, even for delivery, were excluded from both numerator and denominator.	

CHART C-1 (continued)

Variable	Type of Estimating Time	Percent of <i>Unweighted</i> Individuals for Whom An Estimate Was Made
Physician visits, mean number per person year: (16)		
Hospitalized illness	These are physician visits <i>outside</i> of the hospital in conjunction with an illness for which the patient was hospitalized.	8.6% estimated
Major illnesses	These are physician visits outside of the hospital for a chronic or expensive illness.	1.3% estimated
Pregnancies terminating in 1970	These are prenatal care visits and include the delivery and in-hospital visits. They include, in addition to live births, still births, miscarriages, and abortions, both legal and illegal.	2.9% estimated
Minor illnesses, routine checkups, shots, tests, and routine visits to an ophthalmologist for eye refraction	In order to be counted as a doctor visit, the test must have been administered in a doctor's office.	2.2% estimated
Physician visits, mean number seeing a doctor (17)	Estimated as above.	
Physician, percent seeing (14)	This variable was not estimated.	

CHART C-1 (continued)

Variable	Type of Estimating Time	Percent of <i>Unweighted</i> Individuals for Whom An Estimate Was Made
Race (18)	This variable was not estimated.	
Residence (19)	This variable was not estimated.	
Sex (20)	This variable was not estimated.	
Surgical procedures, in- hospital (21)	This variable was not estimated.	

D. Factors Influencing Sample Estimates

Estimates of population characteristics derived from this study may differ from the actual population characteristics because of a number of factors. Some errors in estimates arise from use of samples rather than a complete census. These include sampling variances and problems in executing the sample design. Other errors in estimates arise from use of samples rather than a complete census. These Primary among these are completeness of population coverage and validity of the data. Each of these factors influencing sample estimates is considered below.

1. Sampling Execution

One source of bias in sample estimation is improper execution of the sample design. That is families designated for the sample are not actually interviewed or families not falling into the sample are mistakenly interviewed. The inclusion of nonsample families, despite precautionary measures, undoubtedly occurred, but the effect of such mistakes on the accuracy of estimates is considered slight. Nonresponse error is a more serious concern.

Tables D-1 shows the completion rates for each of the subsamples in the study. The estimates in the report are based on those families which were interviewed. The amount of discrepancy between these estimates and the figures which would have been obtained with full response depends, for any characteristic being estimated, on how different the non-interview families were with respect to this characteristic from those

TABLE D-1
Final completion rates

SAMPLE	ORIG. ^b ASS.	VAC/ ^c NDU	WR ^e	NQ ^f	EXTRA ^g FU	NET ^h ASS.	CC ⁱ	COMP. ^j RATE	FINAL ^k NIR
A	1515	176	5	d	42	1376	1119	.813	257
S ₁ ^a	2887	407	9	d	68	2539	2451	.965	88
S ₂ ^a	2451	d	d	1539	d	912	785	.861	127
U	2068	415	43	d	72	1682	1378	.819	304
R	810	126	d	d	15	699	601	.859	98

^aThe report on the S sample is divided into two parts. S₁ refers to the screening operation. S₂ refers to the regular interviewing.

^bNumber of dwelling units listed in the original sampling frame.

^cDwelling units which were vacant during the interviewing period or had been torn down between the time of listing and the time of interviewing.

^dNot applicable.

^eIndicates wrong race. Some urban segments in the NORC master sample are stratified according to race. When a respondent of the wrong race was observed, no interview was conducted in that household.

^fIndicates not qualified. Applicable only in the S sample where families were screened out if they were non-poor and had no member 66 or over.

^gIndicates extra family units. These units were added when multiple family dwelling units were discovered at the time of interview or multiple dwelling units within the same structure had originally been listed as single units.

^hNet assignment is equal to b-c-e-f-g.

ⁱIndicates number of completed interviews.

^jCompletion rate is equal to i/h.

^kNon-interview reports include "refusals," "breakoffs," "no one home after repeated calls," "language problems," "respondent too ill to be interviewed," etc.

who were interviewed. It would probably be safe to assume in most cases a bias due to nonresponse of not more than $3\frac{1}{2}$ percentage points. This error would appear if the interview cases split 50-50 on the item being measured and those not interviewed split 30-70.

2. Sampling Variances

Standard error is a measure of sampling variance. It shows the variations that might occur by chance because only a sample of the population is surveyed. It does not include biases resulting from problems in the execution of sampling design or in the processing of the data. The chances are about 68 out of 100 that an estimate from the sample would differ from the complete census by less than the standard error. The chances are about 95 out of 100 that the difference would be less than twice the standard error and about 99 out of 100 that it would be less than $2\frac{1}{2}$ times as large.

The computation of standard errors for estimates based on the present sample is complex because of the weighting scheme, because the families in this sample were geographically clustered, and because stratification was used in this selection of the unit. Because of the impossibility of taking into account the full extent of stratification used in our sample design, the method which was used to estimate standard errors tends to lead to conservative results: an overestimate of the magnitude of standard errors.⁵ Tables D-2 and D-3 show the standard errors of estimates made in text tables 4 and 5. It should be kept in mind that standard errors are themselves subject to estimating errors and should therefore be considered as rough approximations of the limits of likely sampling deviation. Tables D-2 and D-3 also include the weighted and unweighted N's of each cell for the text tables.

3. Completeness of Population Coverage

In order to derive estimates pertaining to a period as long as a year from a single wave survey, it is necessary to compensate for the absence on the interview date of individuals who had been members of the population at some time during the year but had left it before the interview date. This is of special importance for a study of this type because of the generally high utilization and expenditures of individuals who died or were institutionalized during the survey year.

An attempt was made to include in the survey at least those decedents and other former members of the population who had, at some time during the survey year, lived with a relative who was still a population member at the end of the survey year. Precautions were taken, however, to make sure that each person who had left the population could be counted as a former member of only one family, thus giving him exactly the same probability of falling in the sample as an individual who was still a member of the population.

TABLE D-2
Sample N's and standard error for Table 4. Percent seeing a
physician during the survey year by selected characteristics: 1970

CHARACTERISTIC	PERCENT SEEING A PHYSICIAN (14)		
	Weighted N	Unweighted N	Standard error
Sex (18)			
Male	27,166	5,311	.0128
Female	28,063	5,936	.0124
Age (1)			
1- 5	4,710	1,028	.0254
6-17	14,544	3,155	.0214
18-34	12,739	2,383	.0163
35-54	12,445	2,217	.0182
55-64	5,208	1,005	.0218
65 and over	5,583	1,459	.0151
Family income (6)			
Low	13,783	4,706	.0153
Middle	18,388	3,700	.0161
High	23,058	2,841	.0151
Race (16)			
White	48,588	7,623	.0110
Non-white	6,641	3,624	.0222
Residence			
SMSA, central city	16,423	5,157	.0166
SMSA, other urban	14,794	1,507	.0246
Urban, non-SMSA	6,680	813	.0440
Rural non-farm	13,564	2,730	.0152
Rural farm	3,767	1,040	.0162
Total	55,229	11,247	.0104

TABLE D-3(A)			
Standard error for Table 5. Percent seeing a physician during the survey year by age by family income: 1970			
AGE (1)	FAMILY INCOME (7)		
	Standard Error		
	Percent low	Percent middle	Percent high
1- 5	.0346	.0369	.0341
6-17	.0304	.0311	.0307
18-34	.0311	.0241	.0243
35-54	.0325	.0304	.0211
55-64	.0297	.0328	.0401
65 and over	.0178	.0215	.0463
Total	.0153	.0161	.0151

TABLE D-3(B)						
Weighted and unweighted N's for Table 5. Percent seeing a physician during the survey year by age by family income: 1970						
AGE (1)	FAMILY INCOME (7)					
	N's					
	Percent Low		Percent Middle		Percent High	
	Weighted	Un-weighted	Weighted	Un-weighted	Weighted	Un-weighted
1- 5	845	409	1,962	395	1,903	224
6-17	2,811	1,261	5,236	1,122	6,496	772
18-34	2,459	805	4,784	902	5,496	676
35-54	1,896	665	3,786	749	6,673	803
55-64	1,795	480	1,663	291	1,751	234
64 and over	3,977	1,086	958	241	648	132
Total	13,783	4,706	18,389	3,700	23,057	2,841

Using this method, it appears that slightly over half of the people in the U.S. population who died during the year was represented in the sample. The actual coverage was somewhat higher, however, because many people who died in the United States during 1970 were residents of institutions and thus not part of the survey universe.

All individuals dying during 1970 who had been living alone or only with individuals who were also to leave the population were excluded since there was no one who could be interviewed on their behalf. Thus the coverage of individuals who left the population is somewhat incomplete. A substantial proportion of the greatest utilizers and highest spenders are represented, however.

4. Validity of the Data

The discussion of factors influencing estimates from the study up to this point has dealt with the possibility of real differences between the sample and the universe sampled caused by sampling variance, completion rate, and population coverage. However, estimates may also differ from the population characteristics because there are discrepancies between the collected data on utilization and expenditure and the actual experience of the sample. The data are valid to the extent that they accurately reflect the sample's behavior. However, distortions can occur between the time of behavior itself and the description of that behavior in the final report. Distortions can also result from inaccurate respondent reporting, the interviewing process, coding, keypunching, data processing, analyzing, and writing of the report.

In this section we will deal only with the information provided by the respondents since this report is based only on data from the social survey. The validity of verification data collected from physicians, hospitals and insuring organizations will be treated in later reports.

It was anticipated that many families would have little detailed information on their health service use and health insurance readily available. Consequently, letters explaining the study and the information sought were sent to all sample families in advance of the interviewer's visit. These letters as well as the interviewers themselves urged respondents to consult any documents such as insurance policies, membership cards, medical bills, or tax records which could provide reliable information. Interviewers reported that over 40 percent of the families consulted at least one document.

The interviewer was instructed on first contact to make an appointment for a time when the family members who knew most about family use of health services and health insurance would be available. During the interview, the main respondents were urged to consult other family members who might be better informed than they about some questions asked. If important information could not be obtained during

the interview, interviewers were instructed to phone later or make additional personal calls to obtain the missing information. It was recognized that in instances of change in family composition (other than by birth) during the year, or in families consisting of several related but unmarried adults, it was unlikely that a single member respondent could give accurate information for the entire year about all family members. In these cases as many family members as necessary were interviewed separately.

The interview schedule used in the 1970 study was that basically the same as that used in the earlier studies. In each study considerable effort was expended in training the interviewers in the use of the schedules. This training included briefing sessions, two trial interviews, and a specially designed interviewer quiz on appropriate administration procedures.

While the emphasis was on comparability between the current survey and the earlier surveys, certain questions were altered and other questions were added in the current study to meet the changing situation with respect to the delivery of medical care in this country and to facilitate some specially planned analyses. Changes in the 1970 questionnaire included a new emphasis on defining regular source of care, questions concerning waiting time and travel time with respect to regular source of care, questions on Medicare coverage, more specification regarding site of physician visits, more detailed questions on third party payment sources (particularly for those categories of third party payment which in previous studies had been classified as "free care"), and more detailed treatment of "unearned income" in order to locate those individuals in the sample who were eligible for Medicaid or welfare payments for the medical care that they received. A special section was also added to the attitude section of the questionnaire dealing with people's perceptions of the health care system. While the length of the interview varied a great deal according to family size and amount of services used, the average length was about an hour and a half.

Considerable effort was devoted to quality control of the field work in the 1970 study. Each interviewer was instructed to edit the questionnaire as soon as possible after the interview was done. If important information had not been obtained, she was instructed to phone the family or make a return visit if necessary. If addresses or names of doctors and hospitals were not clear, she was instructed to look these up in local telephone directories. Other checks on the validity of the interviews were done by the field supervisors in the primary sampling unit. In the NORC central office, a list of critical items was used to determine when a call back was necessary.

Coding was divided among four separate coding sections. A general coding section handled the basic questionnaire material. Special coding sections were established to deal with the coding of insurance information, all hospitalizations, all diagnostic coding, and all estimating. The study staff itself was intimately involved in all special coding procedures. In addition, the diagnostic coding drew heavily upon advice from two medical consultants both in setting up the original codes and in coding difficult or unusual cases, which were reviewed by them once a week.

Comparisons of data from the three verifications with data from the social survey will result in a "best estimate" for many of the variables used in the social survey. However, among the trends over time discussed in this report, only hospital admission trends and days spent in the hospital may be affected. This is because a physician verification was not a part of any of the three previous studies and a dental care verification has not been done for any of the studies. Thus, the trend data for physician and dentist use will not be revised in later reports. Some analyses limited to 1970 study will, of course, use the best estimate data when it is available. Comparisons of the social survey data with data from the verifications will ultimately provide the best analysis of the validity of much of the data in this report.

METHODOLOGICAL APPENDIX

REFERENCES

¹ Andersen, Ronald and Odin W. Anderson, *A Decade of Health Services*. Chicago: University of Chicago Press, 1967, pp. 161-186.

² Ibid., pp. 162-165.

³ A family was included as a "low income" family if they reported their gross income to be less than the following amounts for a given family size:

Family Size	Monthly	Yearly	Weekly
1	\$220	\$2,600	\$ 50
2	310	3,700	70
3	370	4,500	85
4	470	5,700	110
5	550	6,600	130
6	620	7,500	145
7	760	9,100	175

⁴ *Current Population Reports*, Series P-60, No. 80, October 4, 1971, pp. 30-32.

⁵ The method is discussed in Leslie Kish, *Survey Sampling*. New York: John Wiley & Sons, Inc., 1965, pp. 182-216.

